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would never recover from! Some knowledge of Latin is essential; a more extended knowledge is highly desirable as an accessory aid to memory.

Advanced English I place fifth in my list, giving it a lower place because a knowledge of English is presupposed. But in including it I mean to advise the more advanced and critical knowledge of the language; a knowledge which permits us to speak and write it fluently and elegantly. A knowledge which has enlarged our vocabulary and has made us widely acquainted with English literature and its development—a knowledge which has developed the reading habit and which makes us familiar with other people's thoughts and habits of thought. If I were to teach English to prospective medical students, I should also lay great stress upon the daily theme upon current events.

German and French I place sixth and seventh in my list as valuable chiefly by enabling us to become conversant with the literature and scientific progress of other nations and peoples. One or more foreign medical journals a week help one amazingly to keep pace with foreign progress. German and French are valuable, too, as enabling us to communicate at first hand with foreigners if we study abroad, or with our foreign patients in practise at home. Few persons, not physicians, realize how greatly our foreign population is increasing. I remember at my clinic one day, when I was late, and four children had been kept for me to examine, that one was an Italian, one a Russian, one a Greek and one a Syrian!

Economics and sociology would come eighth and ninth in the procession, both of immense importance to the medical man; tenth and eleventh, at the risk of being called an iconoclast, I should rank drawing and painting, and shorthand writing, and

to round out the dozen, let us add public speaking.

These subjects will not, of course, occupy the student's whole time while in college. Place is left for other elective studies. In these other elective fields the student can roam according to his fancy. The suggested studies form the basis of his work; the supplementary excursions furnish variety. Nothing is lost from the broadening effects of his college course, but much is gained from its concentration.

And now, before I release you for your short respite of well-earned leisure, let me quote to you the words of Kipling to the students in a London Hospital, and say that I need not "stretch your patience by talking to you about the high ideals and lofty ethics of a profession which exacts from its followers the largest responsibility and the highest death rate—for its practitioners—of any profession in the world. If you will let me, I will wish you in your future what all men desire—enough work to do and strength enough to do the work."

HAROLD WILLIAMS

TUFTS COLLEGE MEDICAL SCHOOL

AN INTERNATIONAL COOPERATIVE INVESTIGATION ON ELECTRICAL STANDARDS

THE International Electrical Conference, which met in London in October, 1908, passed certain resolutions with regard to electrical units and standards, but left to an international committee, which was established at that time, the duty of completing the specifications for the concrete electrical standards, and of deciding upon a new numerical value for the Weston normal cell which could be adopted internationally.

As is well known, the value for the Clark standard cell (1.434 volts at 15° C.) which was adopted by the Chicago Electrical Congress in 1893, was not accepted by Germany. After further experimental investigations, Germany adopted the value, 1.4328 volts at 15° C. England, America, France and some

other countries have followed the Chicago Congress, whereas other countries have followed Germany, and hence there have been two different values for the volt in use.

In course of time, the method of preparation of the Clark cell was improved so that the cell became more reliable, but at the same time its electromotive force was slightly altered. At the Bureau of Standards, an allowance was made for the change in the E.M.F. of the Clark cell, so as to preserve the unit of electromotive force unaltered. In England, however, the original numerical value was retained in spite of the fact that the new cells had slightly different values from the old. The result was that a discrepancy arose between the values in use in England and America. Hence, there were and still are three different volts in use in different countries. The Weston normal cell, officially adopted at the London Conference in place of the Clark cell, has the following values: In America, 1.0189 at 25°, equivalent to 1.019125 volts at 20°; in Germany, 1.0186 volts at 20°; in England, 1.0184 volts at 20°. Some of the other countries have the same value as America, others the same as Germany. England adopted the last-named value only one year ago, and no other country, as far as known, has followed its example.

The London Conference of 1908 adopted the ohm as represented by the resistance of a specified column of mercury, and the ampere as represented by a certain mass of silver deposited in a silver voltameter, as the two independent fundamental electrical units, and declared that the value of the volt should be derived from these two. The electrochemical equivalent of silver adopted at London was 1.11800 milligrams of silver per second per ampere of current. It was known that different investigators had obtained different values for the electrochemical equivalent of silver, according to the kind of voltameter used and the methods of preparing the silver nitrate, so that the international committee found itself confronted with the problem of preparing specifications for the voltameter, when there was a great difference of opinion as to the proper procedure and as to the true value of

the electrochemical equivalent of silver, which had, however, been definitely fixed by the conference.

The International Committee on Electrical Units and Standards is authorized by the London Conference to complete the work of the conference and to carry on intercomparisons of standards among different countries, and to promote investigations upon the subject of electrical units and standards, to the end of securing international uniformity with the highest obtainable accuracy. This committee represents eleven different countries, there being two members each from America, England, France and Germany, and one member each from Austria, Italy, Russia, Switzerland, Holland, Belgium and Japan. The president of the committee is Professor Dr. E. Warburg, president of the Reichsanstalt, Berlin; vice-president, Dr. R. T. Glazebrook, director of the National Physical Laboratory, London; treasurer, Professor S. W. Stratton, director of the Bureau of Standards; secretary, Professor E. B. Rosa, physicist of the Bureau of Standards. The other eleven members of the committee are as follows: Dr. Osuke Asano, Department of Communications, Tokyo, Japan; M. René Benoît, Bureau International, Sevres, France; Dr. N. Egeroff, director, General Chamber of Weights and Measures, St. Petersburg, Russia; Professor Eric Gérard, Liège, Belgium; Professor H. Haga, Groningen, Holland; Dr. Ludwig Kuzminsky, Commission of Weights and Measures, Vienna, Austria; Dr. Stephen Lindeck, Physikalisch-Technische Reichsanstalt, Berlin, Germany; Professor Gabriel Lippmann, The Sorbonne, Paris; Professor Antonio Ròiti, Florence, Italy; Mr. A. P. Trotter, Electrical Standards Laboratory, Whitehall, London; Professor H. F. Weber, Zürich, Switzerland.

In addition to the fifteen members appointed by the International Electrical Conference, the committee was authorized to elect associate members to assist in carrying on its work, and at its first meeting in London, following the conference, five associate members were elected as follows: Dr. W. Jaeger, of Berlin; Mr. F. E. Smith, of Lon-

don; Professor Paul Janet, of Paris; Professor H. S. Carhart, of Ann Arbor, Michigan, and Dr. F. A. Wolff, of the Bureau of Standards, Washington.

It was impossible to select a new value of the Weston normal cell in terms of the ohm and the ampere until the latter should be more precisely defined than had been done by the London Conference. Correspondence among the members of the committee who were connected with national standardizing institutions seemed to indicate that it would be impossible to agree upon the specifications of the silver voltameter without further investigation, and it was proposed by the American members of the committee that a joint investigation to clear up, as far as possible, outstanding problems on the standard cell and the silver voltameter be arranged with representatives of several of the national standardizing laboratories as participants. Professor S. W. Stratton in his capacity as director of the Bureau of Standards offered the facilities of the Bureau of Standards for an international investigation, and in his capacity as treasurer of the International Committee on Electrical Units and Standards offered to secure the funds to pay the expenses of the investigation. In this connection he received valuable assistance from Mr. John W. Lieb, Jr., who placed the matter before the governing bodies of the American Institute of Electrical Engineers, the National Electric Light Association, the Association of Edison Illuminating Companies and the Illuminating Engineering Society. These four societies made appropriations of \$500 each to defray the expenses of the proposed investigation. Their generosity in this matter is very highly appreciated by the International Committee on Electrical Units and Standards. Some smaller contributions were also received.

It was arranged that the proposed investigation should be carried out at the Bureau of Standards by representatives of that institution together with one delegate from the *Physikalisch-Technische Reichsanstalt*, Berlin, one from the National Physical Laboratory, London, and one from the *Laboratoire*

Central d'Electricité, Paris. The European delegates, as appointed by the directors of the three above named institutions, are Professor W. Jaeger, Mr. F. E. Smith and Professor F. Laporte. These gentlemen have had a very considerable experience in work with standard cells and silver voltameters, have published various investigations on the same, and are eminently qualified to represent their respective institutions and to join in the work of research and deliberation upon the various questions that will arise during their stay in Washington. The representatives of the Bureau of Standards are Professor E. B. Rosa and Dr. F. A. Wolff. In addition to published papers, a great deal of experimental work has been done at the Bureau of Standards which is not yet published, which throws considerable light upon the questions at issue.

In addition to the work on standard cells and the silver voltameter, a comparison is to be made of the resistance standards of the several national standardizing institutions. The wire standards of the *Reichsanstalt*, the National Physical Laboratory and the Bureau of Standards differed only about two parts in a hundred thousand at the last intercomparison about a year ago, the standards of the first two of the above institutions having been fixed independently by legally specified mercury ohms. It is expected that a common value of the international ohm will be agreed upon, so that no difference greater than one part in a hundred thousand will exist between the wire standards of the national standardizing institutions.

It is confidently expected that the committee will succeed in coming to a satisfactory agreement with respect to the official specifications of the silver voltameter and the Weston normal cell, and will be able to agree upon a value for the latter which can be recommended to all countries of the world for adoption. The degree of accuracy which is now obtainable in electrical measurements, both in absolute measurements and in relative measurements, far surpasses what was possible in 1893, and indeed has increased greatly within the last five years. There is

reason to believe that values adopted now will be satisfactory for a generation at least without change. The European delegates have brought with them, from their own laboratories, a quantity of apparatus and chemicals in order that they may reproduce work done in their own laboratories at the Bureau of Standards, as accurately as possible. Standard cells will be set up by the representatives of each of the four institutions, and accurately compared and tested. In the same way different forms of silver voltameters will be operated in series with one another, and the quantity of silver deposited in each determined with very great accuracy. The Bureau of Standards has provided every facility for carrying on this work expeditiously and with the highest precision.

The three European delegates arrived from Europe recently, and proceeded to Washington after a short stay in New York, in time to begin their work at the appointed time, April 1. It is not known how long the work will continue, but it is hoped to complete it in two months.

EDWARD B. ROSA

FEDERAL EXPENDITURES FOR THE CONSERVATION OF THE NATIONAL HEALTH

CERTAIN contributors to *American Health* (the official organ of the American Health League, published by the Committee of One Hundred) have expressed the opinion, that while the care and health of animals is a matter of extreme importance to the federal government, the health of human beings, on the other hand, is a matter of indifference. At least, this is what one would infer from the following quotations taken from *American Health*:

John Pease Norton, Ph.D., *American Health*, March, 1908, page 12:

We look with horror on the black plague of the middle ages. The black waste was but a passing cloud compared with the white waste visitation. Of the people living to-day over eight millions will die of tuberculosis, and the federal government does not raise a hand to help them.

THE DEPARTMENT OF AGRICULTURE PROTECTS ANIMALS

The Department of Agriculture spends seven million dollars on plant health and animal health every year, but, with the exception of the splendid work done by Doctors Wiley, Atwater and Benedict, Congress does not directly appropriate one cent for promoting the physical well-being of babies. Thousands have been expended in stamping out cholera among swine, but not one dollar was ever voted for eradicating pneumonia among human beings.

Mrs. Gibson Arnoldi, Bulletin of the Committee of One Hundred on National Health, September, 1909, page 8:

The national government of the United States spends \$7,000,000 on plant and animal health every year, and hundreds of thousands fighting beetles and potato bugs, but not one cent to aid the six million babies that will die under two years of age during the next census period while mothers sit by and watch in utter helplessness. This number could probably be decreased by as much as one half. Why is nothing done? . . . Bulletin No. 33 of the Committee of One Hundred on National Health, October 1909:

At a meeting held in Denver in August an interesting paper on meat inspection was read by Miss Lakey, chairman of the food committee of the National Consumers' League. Resolutions were adopted recommending that states and cities should provide more sanitary slaughter houses. Miss Lakey showed that the federal inspection is inadequate.

To those who are more familiar with the health work now being carried on by the federal government here at Washington and in its branch laboratories, these statements, while correct as to certain details, are objectionable because of their implications. The above quotation from Bulletin 33, for example, was so placed as to carry (to the writer at least) the impression that the federal inspection was being criticized, not alone as to the quantity of meat inspected, but also as to the quality of the inspection. The writer has been corrected by one who attended the Denver meeting of the Association of State and National Food and Dairy Departments, and informed that the federal meat inspection service was held up by Miss Lakey as a good